

## CLAIMS

### WHAT IS CLAIMED IS:

- 1           1. A method of testing a planar lightwave circuit comprising:  
2                 coupling a first optical probe having a side-polished optical fiber to the  
3                 planar lightwave circuit; and  
4                 testing an optical pathway within the planar lightwave circuit by transmitting  
5                 or receiving light through the first optical probe.
- 1           2. The method of claim 1 further comprising:  
2                 coupling a second optical probe having a second side-polished optical fiber  
3                 to the planar lightwave circuit; and  
4                 using the second optical probe in combination with the first optical probe to  
5                 send and receive a light beam through the planar lightwave circuit.
- 1           3. The method of claim 1 further comprising:  
2                 using an index-matching fluid as an interface between the first optical probe  
3                 and the planar lightwave circuit.
- 1           4. The method of claim 1 further comprising:  
2                 adding an additional layer of upper cladding to the planar lightwave circuit  
3                 after removing the first optical probe.

1           5. The method of claim 1, wherein testing the optical pathway within the planar  
2 lightwave circuit is performed on a PLC wafer prior to dicing the PLC wafer.

1           6. The method of claim 1, wherein testing the optical pathway within the planar  
2 lightwave circuit is performed on a PLC die prior to permanently attaching optical fibers  
3 to the PLC die.

1           7. The method of claim 1, wherein testing the optical pathway within the planar  
2 lightwave circuit is performed on a PLC die after permanently attaching optical fibers to  
3 the PLC die.

1           8. A method of testing a planar lightwave circuit comprising:  
2               coupling a first optical probe to a first portion of the planar lightwave circuit;  
3               directing a light beam through the first optical probe into the planar  
4               lightwave circuit;  
5               coupling a second optical probe to a second portion of the planar lightwave  
6               circuit; and  
7               receiving the light beam through the second optical probe, wherein the first  
8               and second optical probes comprise side-polished optical fibers.

1           9. The method of claim 8 further comprising:  
2               using an index-matching fluid as an interface between the first optical probe  
3               and the planar lightwave circuit.

1           10. The method of claim 8, wherein the first optical probe is positioned with six  
2 degrees of freedom.

1           11. The method of claim 8, wherein the second optical probe is positioned with  
2 six degrees of freedom.

1           12. The method of claim 8, wherein directing the light beam through the first  
2 optical probe into the planar lightwave circuit is accomplished by coupling a laser to the  
3 first optical probe.

1           13. The method of claim 8, wherein testing the planar lightwave circuit is  
2 performed on a PLC wafer comprising multiple identical PLC dice.

1           14. The method of claim 8, wherein testing the planar lightwave circuit is  
2 performed on a PLC die prior to permanently attaching optical fibers to the PLC die.

1           15. The method of claim 8, wherein testing the planar lightwave circuit is  
2 performed on a PLC die after permanently attaching optical fibers to the PLC die.

1           16. An optical probe comprising:  
2               an optical fiber that has been side-polished; and  
3               an alignment stage to hold the optical fiber in position as a directional  
4               coupler with a planar waveguide.

1           17. The optical probe of claim 16, wherein the alignment stage allows six degrees  
2 of freedom for movement of the optical fiber.

1           18. The optical probe of claim 16 further comprising:  
2           a laser coupled to provide a light beam into optical fiber.

1           19. The optical probe of claim 16 further comprising:  
2           a photodetector coupled to receive a light beam through the optical fiber.

1           20. A method of making an optical probe comprising an optical fiber having a  
2 core and an outer cladding, the method comprising:  
3           polishing a side of the optical fiber until the core of the optical fiber is  
4           exposed; and  
5           attaching a first portion of the optical fiber to an alignment stage.

1           21. The method of claim 20 further comprising:  
2           attaching a second portion of the optical fiber to a light source.

1           22. The method of claim 20 further comprising:  
2           attaching a second portion of the optical fiber to photodetector.